

## DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

### RCRA Corrective Action

#### Environmental Indicator (EI) RCRIS code (CA725)

#### Current Human Exposures Under Control

**Facility Name:** Boyertown Sanitary Landfill  
**Facility Address:** 300 Merkel Road, Gilbertsville, PA 19525  
**Facility EPA ID #:** PAD 048 603 005

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

  X   If yes - check here and continue with #2 below.  
       If no - re-evaluate existing data, or  
       if data are not available skip to #6 and enter "IN" (more information needed) status code.

### **BACKGROUND**

#### **Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

#### **Definition of "Current Human Exposures Under Control" EI**

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

#### **Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

#### **Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**<sup>1</sup> above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			Groundwater Monitoring Results/TCE
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)	X			Leachate seeps
Surface Water		X		
Sediment		X		
Subsurf. Soil (e.g., >2 ft)	X			Leachate seeps, landfill gas migration
Air (outdoors)		X		

\_\_\_\_\_ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_\_\_ If unknown (for any media) - skip to #6 and enter “IN” status code.

**Rationale and Reference(s):**

TCE has been found in AMW-1 since implementing the groundwater monitoring system at the landfill. The garage proximate to this well was used as a washbay for vehicles. Solvents were used to degrease engines and were washed down the drain into onlot septic system for the garage. The TCE is not a result of the landfill. TCE was recorded at 68 ppb in the early 1980's and latest results show a level of 20 ppb. The medium-specific concentration (MSC) is 5 ppb. The preceding is taken from the 2000 EI determination and the 2004 CME sample data. These results are addressed in a separate groundwater EI evaluation.

In 2001, leachate seeps were reported. An unknown discharge was reported in the backyard of a residential dwelling adjacent to the landfill. Although soil and water sampling indicated that no parameters exceeded Statewide Health Standards, subsequent investigation confirmed that source of the discharge was leachate from the landfill. Trenches were dug on the landfill property to further investigate the seeps. Landfill gas at and above explosive levels was discovered during excavation of the trenches. Monitoring of nearby residential dwellings did not result in any detection of landfill gas in the dwellings. However, the existence of the leachate seeps and the landfill gas indicated that leachate and gas was not being contained within the landfill itself and was migrating within, and possibly off of, the landfill property. Although, except for the leachate seep, no evidence existed of any direct impact to neighboring properties, the existence of the uncontrolled seeps and gas indicated a potential for leachate contamination or explosive levels of gas off site if not properly contained and remediated. Evidence indicated that this potential would be limited to shallow or subsurface soils. For these reasons, in 2002, PADEP proposed changing the EI status for Human Health from “YE” to “NO”, although USEPA subsequently decided to change the status to “IN” rather than “NO” because only concerns about, but no evidence of, off-site migration were of issue.

Subsequently, PADEP concluded indoor air monitoring during 2002 and 2003 from several homes downgradient and adjacent to the landfill. Readings were collected from basements (floating slab basement with 18" deep sumps). No methane concentrations were discovered in the 11 homes monitored.

A follow-up investigation and engineering evaluation was contracted for in 2004. The work was conducted by Tetra Tech FW, Inc. (TTFW) for PADEP and USEPA pursuant to a contract with PADEP. A June 2004

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report was prepared by TTFW and submitted to PADEP. The report assessed the landfill to be in fair condition. Fence installation/repair and access road/stormwater management improvements were the main needs identified. Leachate and gas collection systems were assessed to be adequate, and the “Shaw” system, if placed into operations, was expected to help improve the gas and leachate seepage concerns. No adverse impacts to surface water were found. While on-site gas monitoring points found high levels of methane in some of the monitoring points, no evidence exists that gas is migrating or has migrated off-site. Leachate seeps still occur on-site, but off-site runoff has been determined to be not leachate-related.

While leachate and gas migration concerns remain, their impacts appear to be contained within the landfill property. Ground and surface water monitoring do not reflect any indication of more wide-spread impact. Based on the lack of evidence of off-site migration, it is believed that EI status should be revised to “YE”. However, the situation at the landfill is highly dependent on proper monitoring and maintenance. The last sampling conducted at the landfill by the owner was 2<sup>nd</sup> quarter of 2003. There have been no sampling since then, and no indication that further sampling will be conducted. Consequently, the EI status should be re-evaluated on a regular basis.

<sup>1</sup> “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

**Summary Exposure Pathway Evaluation Table**

Potential **Human Receptors** (Under Current Conditions)

<b><u>“Contaminated” Media</u></b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	N	N	N	N			N
Air (indoors)	—	—	—				
Soil (surface, e.g., <2 ft)	N	Y	N	Y	Y	N	N
Surface Water	—	—				—	—
Sediment	—	—				—	—
Soil (subsurface e.g., >2 ft)	N	Y	N	Y	N	N	N
Air (outdoors)	—	—	—	—	—		

Instructions for **Summary Exposure Pathway Evaluation Table**:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“—”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

— If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

X If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.

— If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code.

**Rationale and Reference(s):**

Groundwater flow in the area is horizontal and shallow. All groundwater on the garage side discharges into Minister Creek. Sample results from upstream and downstream of the landfill indicate no impact on the creek from TCE.

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The existence of leachate seeps and the finding of landfill gas during leachate seep investigations remain a concern on-site. While this is a potential exposure pathway to workers, it is known hazard that can be dealt with by proper precautions during any construction, maintenance or remediation activity. Further, it is a normal hazard when dealing with any on-site construction or excavation activity at a closed landfill. No evidence of gas migration into neighboring structures has been found. While a concern, the exposure pathway to off-site receptors does not appear complete at this time.

3 Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

  X   If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

       If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

       If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

**Rationale and Reference(s):**

Uncontrolled surface and/or subsurface flow of leachate (seeps) could lead to direct human exposure via contact with leachate or via contamination of groundwater supplies. Uncontrolled migration of landfill gas could result in explosive levels of gas collecting in neighboring underground or subgrade structures. No evidence of such off-site migration or contamination currently exists, thus a complete pathway cannot be demonstrated. Worker or construction exposure pathways can be adequately managed by taking the proper precautions when conducting maintenance or excavation activities on-site.

<sup>4</sup> If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

\_\_\_\_\_ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

\_\_\_\_\_ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

\_\_\_\_\_ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

**Rationale and Reference(s):**

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  X     YE - Yes, “Current Human Exposures Under Control” has been verified. Based on a review of the information contained in this EI Determination, “Current Human Exposures” are expected to be “Under Control” at the Boyertown Sanitary Disposal Landfill facility, EPA ID # PAD 048 603 005, located at 300 Merkel Road, Gilbertsville, PA 19525 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

         NO - “Current Human Exposures” are NOT “Under Control.”

         IN - More information is needed to make a determination.

Supervisor	(signature) signed	Date	8-30-04
	(print) Ronald C. Furlan, P.E.		
	(title) Regional Manager/Waste Management Program		
	(EPA Region or State) PADEP/SERO		

**Locations where References may be found:**

**Contact telephone and e-mail numbers:**

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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**